

Patent Claims:

- 1 – 8 (canceled)
9. (new) An electrically controlled optical add-drop multiplexer, comprising:
an optical waveguide;
a multiplexer;
a demultiplexer;
an optical filter;
a micro-electrical-mechanical system; and
an optical amplifier,
wherein the optical components and electrical components for controlling the add-drop multiplexer are arranged on a multilayer printed circuit board with electrical and optical conductor paths.
10. (new) The add-drop multiplexer according to Claim 9, wherein a layer of the multilayer printed circuit board has both optical and electrical conductor paths.
11. (new) The add-drop multiplexer according to Claim 9, wherein the multilayer printed circuit board has organic and inorganic materials.
12. (new) The add-drop multiplexer according to Claim 9, wherein the multilayer printed circuit board has organic or inorganic materials.
13. (new) The add-drop multiplexer according to Claim 9, the optical conductor paths are made of glass and polymers.
14. (new) The add-drop multiplexer according to Claim 9, the optical conductor paths are made of glass or polymers.
15. (new) The add-drop multiplexer according to Claim 9, wherein the optical conductor paths are fashioned from an element from the group consisting of: glass, silicon oxide, silicon dioxide, and polymer.

16. (new) The add-drop multiplexer according to Claim 9, wherein the optical conductor paths have three-dimensional optical structures such that two optical conductor paths arranged in different layers of the multilayer printed circuit board are connected to one another.

17. (new) The add-drop multiplexer according to Claim 9, the optical conductor paths contain a doping.

18. (new) The add-drop multiplexer according to Claim 9, wherein the add-drop multiplexer further comprises; an electro-optical device, an opto-electrical device, and an optical device.